

## Additions to the genus *Lessingianthus* (Asteraceae, Vernonieae) from South America

Adições ao gênero *Lessingianthus* (Asteraceae, Vernonieae) da América do Sul

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### Abstract

Two new species of *Lessingianthus* (Asteraceae: Vernonieae) are described and illustrated. One of these, *L. foliosus* Dematt., bears a resemblance to *L. vepretorum*, but can be separated from it by its linear leaves, that are lanate on the abaxial surface, and by its shorter internodes. The other new species, *L. lapinhensis* Dematt., can be easily separated from *L. brevifolius* and other taxa of the genus by the combination of stems 8-18 cm tall, glabrous linear leaves and campanulate involucre. Thirteen other taxa previously described as *Vernonia* are transferred to the genus *Lessingianthus* and two lectotypes are designated here.

**Key words:** Compositae, new combinations, new species, *Vernonia*.

### Resumo

Duas novas espécies de *Lessingianthus* (Asteraceae: Vernonieae) são descritas e ilustradas. Uma dessas espécies, *L. foliosus* Dematt., apresenta semelhança com *L. vepretorum*, mas diferencia-se dela pelas folhas lineares, lanosas na face abaxial e pelos entrenós mais curtos. A outra espécie, *L. lapinhensis* Dematt., pode ser distinguida facilmente de *L. brevifolius* e outros táxons do gênero pela combinação de caule 8-18 cm compr., folhas lineares, glabras e involucre campanulado. Outros treze táxons descritos como *Vernonia* são transferidos para o gênero *Lessingianthus* e dois lectótipos são aqui designados.

**Palavras-chave:** Compositae, novas combinações, novas espécies, *Vernonia*.

### Introduction

The genus *Lessingianthus* H. Rob. (Robinson 1988) was initially established to recognize the species originally arranged under *Vernonia* Schreb. sect. *Lepidaploa* (Cass.) DC. series *Macrocephalae* Benth. & Hook. (Bentham & Hooker 1873). It is widely distributed in South America, including Venezuela, Colombia, Peru, Brazil, Bolivia, Paraguay, Argentina and Uruguay (Robinson 2007). Almost all the species are perennial herbs, with medium or large-sized capitula and seriate-cymose inflorescences (Robinson 1988). The genus comprises more than 120 species that mostly occur in *campo cerrado* and *campo rupestre* habitats (Bremer 1994).

This group can be distinguished from the remaining American members of the tribe by its eglandular anther appendages, lack of basal style node and quadrate raphids in the achene wall

(Robinson 1999). The genus is distinguished also by the surface morphology of the pollen grains and the basic chromosome number. The pollen grains have been called type "B" by Keeley & Jones (1979) and they are tricolporate, echinolophate, with a discontinuous tectum, very long germinal furrows that converge at the poles and lacunae distributed in a regular pattern but lacking a polar lacuna (Dematteis & Pire 2008). The basic chromosome number of the genus is  $x=16$ , differing from the majority of the American Vernonieae with a base number of  $x=17$  (Dematteis 2002).

Following the segregation of *Lessingianthus* (Robinson 1988), the only modification has been the transference of *Lessingianthus* subgen. *Oligocephalus* H. Rob. to the genus *Chrysoalaena* H. Rob. (Dematteis 2007). Nevertheless, several species still included in *Vernonia* have not been examined and consequently their taxonomic

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position remains uncertain. In this paper, two new species are described and thirteen taxa previously placed in *Vernonia* are transferred to *Lessingianthus*.

## Materials and Methods

This study was based on morphological analysis of specimens deposited at BA, BCN, BM, BR, C, CTES, CESJ, ESA, F, FCQ, G, G-DC, HBR, ICN, K, L, LIL, LP, LPB, MBM, MNES, NY, P, PACA, R, S, SI, SP, SPF, UEC, US, USZ and W (Holmgren *et al.* 1990). The terminology applied for the description of the species in general follows Robinson (1988) and Dematteis (2007). The line drawings were realized under camera lucida with a Leica MZ6 stereo microscope using herborized specimens. The abbreviations used for authors' names are those recommended by Brummit & Powell (1992). Journal abbreviations are from *Botanico Periodicum Huntianum* (Lawrence *et al.* 1968) and book abbreviations are from the many volumes of *Taxonomic Literature*, edition 2 (Stafleu & Cowan 1976-1988).

Pollen samples were obtained by removing one or two florets from herbarium specimens of the species. The pollen grains were acetolysed according to the procedure suggested by Erdtman (1966). For light microscopy (LM) the pollen samples were mounted in glycerine-jelly on glass slides and then examined with a Zeiss Axioplan microscope. Permanent slides were deposited at the Palynological Laboratory of the Universidad Nacional del Nordeste (PAL-CTES). For scanning electron microscopy (SEM), acetolysed pollen grains were firstly washed in 96° alcohol and absolute alcohol, next sputtered with gold-palladium and then observed in a JEOL 5800 LV scanning electron microscope. The terminology applied for pollen grain description in general follows Keeley & Jones (1979).

## Results

*Lessingianthus foliosus* Dematt., *sp. nov.* Type: BRAZIL. SÃO PAULO: Campos da Bocaína, 7.1.1876, fl. c fr., A.F.M. Glaziou 8133 (holotype P 00372495; isotypes G, P 00372496, photo F 37338).

Fig. 1, 3a

*Vernonia paulensis* Glaz., Bull. Soe. Bot. France 56, Mém. 3d: 370. 1909, *nom. nud.*

*Lessingianthus vepretorum* (Mart. ex DC.) H. Rob. *affinis sed foliis linearibus subtus lanatis et internodiis brevioribus. Suffrutex erectus 40–80 cm altus, caulibus rotundatis, dense foliatis. Folia linearia, 15–25 mm longa, coriacea, discoloria. Capitula 3–8,*

*pedunculata, corymbosa. Corolla 8–9 mm longa, lobis lanceolatis 3.1–3.5 mm longis.*

Erect shrubs, 40–80 cm height, with xylopodia. Stems 1–3, simple, rounded, densely leafy at the inflorescence, scarred on the lower portion, internodes 1–4 mm long. Leaves alternate, ascending, sessile, coriaceous, discolorous; leaf blades linear, 15–25 mm long, 2–4 mm wide, entire, revolute at margins, apically acute, cuneate at base, glabrous above, lanate beneath, pinnatinervate, secondary veins prominent above. Inflorescence terminal, corymbose, 3–6 cm long, bearing 3–8 capitula; capitula discoid, solitary, pedunculate, peduncles densely lanate, 2–5(–8) mm long; inflorescence bracts leafy, longer than capitula. Involucres campanulate, 7–9 mm high, 6–8 mm diameter; phyllaries 4- or 5-seriate, imbricate, appressed, yellowish, inner phyllaries lanceolate to ovate-lanceolate, mucronate, lanate to villous, 4–6 mm long, 1.0–1.3 mm wide, outer ovate, acuminate, lanate toward apex, 1.5–3.5 mm long, 0.8–1.2 mm wide. Florets 18–22 per capitulum; corollas violet, glabrous, 8–9 mm long, 1.8–2 mm diameter, lobes lanceolate, 3.1–3.5 mm long; anthers basally calcarate, thecae 3.0–3.2 mm long, apical appendages ovate, 0.5–0.6 mm long; style 10–11 mm long, branches linear, 2.5–3 mm long. Cypselas obconical, ribbed, densely sericeous pubescent, 2–2.5 mm long; pappus biseriate, grayish, inner bristles 5.5–6 mm long, outer scales lanceolate, fimbriate, 0.6–0.8 mm long. Pollen grains spheroidal, tricolporate, echinolophate, 55.76–66.64 µm diameter, spines 2.1–4.0 µm long and lacunae 10.80–16.32 µm diameter (type "B").

This taxon was initially determined as a new species by Glaziou in herbarium specimens deposited at P, but it remained unknown until the author published (posthumously) the *Plantae Brasiliae centralis a Glaziou lectae* (Glaziou 1909-1910). In this article, the author listed all the species of Asteraceae from central Brazil, including also *Vernonia paulensis*. This name was also included in the Supplement IV of *Index Kewensis* (Prain 1913), but the name was published without a validating description, according to the International Code of Nomenclature (McNeill *et al.* 2006). A detailed examination of the specimens collected by Glaziou showed that they constitute a hitherto undescribed species belonging to the genus *Lessingianthus*.

The new species bears a resemblance to *Lessingianthus vepretorum* (Mart. ex DC.) H. Rob., but can be separated by its 18–22 florets per capitulum (vs. 25–30 in *L. vepretorum*), peduncles 2–5 mm





**Figure 1** – a-l. *Lessingianthus foliosus* Dematt. – a. plant; b. detail of the leaves; c. capitulum; d. corolla showing anthers and style; e. corolla lobe apex; f-h. outer phyllaries; i-j. middle phyllaries; k-l. inner phyllaries. (a-l Glaziou 8133).

long (vs. 5–15 mm), linear (vs. lanceolate to oblong-lanceolate) leaves, lanate (vs. incanous or grayish-white) on the abaxial surface and internodes 1–4 mm (vs. 20–50) long. The name refers to the leaves density of the new species.

*Lessingianthus lapinhensis* Dematt., *sp. nov.* Type: BRAZIL. MINAS GERAIS: Santana do Riacho, Serra da Lapinha, maciço NW da Serra do Cipó, próximo da localidade da Lapinha, a ca. 50 km da rodovia Belo Horizonte-Conceição do Mato Dentro, em solo arenoso-pedregoso, encharcado, 1300 m alt., 27.III.1991, fl. e fr., J.R. Pirani, A.M. Ginlietti, N.L. Menezes, M. Seguro, J.V. Coffani Nunes, F.A. Vitta & L. Parra-Lazzari 12129 (holotype SPF; isotype CTES). Fig. 2, 3b.

*Haec species Lessingiantho brevifolio (Less.) H. Rob. similis sed foliis glabratis, involucribus angustioribus et corollis brevioribus differt. Herba erecta 8–18 cm alta, caulibus simplicibus rotundatis dense foliatis. Folia linearia, 8–16 mm longa, 5–8 mm lata, utrinque glabrata. Capitula solitaria, campanulata ad inflorescentiam cymosam 2-5-cephala disposita. Corolla 10–11 mm longa, lobis lanceolatis, 3.2–3.6 mm longis.*

Perennial herbs, 8–18 cm height, with small xylopodia. Stems 2 or 3, rounded, glabrous, 1–1.5 mm in diameter, densely leafy to inflorescence, scarred in lower portion, internodes 0.5–0.8 mm long. Leaves alternate, dense, ascending, coriaceous, aciculiform, 8–16 mm long, 0.5–1 mm wide; leaf blades narrowly linear, entire, margins revolute, apically acute, basally cuneate, glabrous, 1-veined. Capitula pedunculate, solitary at stem apex or in a lax corymb, bearing 2–5 capitula; involucre campanulate, notably shorter than capitula, 8–9 mm high, 11–13 mm diameter; phyllaries appressed, yellow-brownish, 5- or 6-seriate, inner linear-lanceolate, acute, glabrous or laxly lanate towards apex, 8–10 mm long, 1.5–1.7 mm wide, outer phyllaries triangular to oblong, acuminate, completely lanate, 3–5 mm long, 0.6–1 mm wide. Florets 20–25; corollas purple, glabrous, 10–11 mm long, 2.5–3 mm diameter, lobes linear-lanceolate, 3.2–3.6 mm long; anthers 4.2–4.5 mm long, basally caudate, apical appendage ovate, 0.4–0.5 mm long; styles 11–12 mm long, branches linear, pilose, 2.2–2.5 mm long. Cypselas densely sericeous-pubescent, 2–2.5 mm long; pappus biseriata, inner bristles setaceous, 9–10 mm long, outer scales linear, 1.5–1.8 mm long. Pollen grains tricolporate, echinolophate, 47–50 µm diameter (type "B").

The new species appears to be closely related to *Lessingianthus brevifolius* (Less.) H. Rob. by the shape and distribution of the leaves, but it differs mainly in having hemispherical involucre, leaves lanate on the abaxial surface, 40–50 florets per capitulum and corollas 14–15 mm long, amongst others features. It is only known from southwestern Minas Gerais in the Serra do Cipó. It grows on the *campo rupestre* habitats, which possesses rocky and sandy soils occupied by shrubby savannas and grasslands. In Brazil, this habitat is especially represented in the Serra do Espinhaço and associated ranges in Minas Gerais, the Chapada Diamantina in Bahia, and the Serra Geral in Goiás (Oliviera-Filho & Ratter 2002).

*Lessingianthus constrictus* (Matzenb. & Mafiol.) Dematt., *comb. nov.* *Vernonia constricta* Matzenb. & Mafiol., *Napaea* 10: 19. 1994. Type: BRAZIL. RIO GRANDE DO SUL: Capão da Canoa, 10.I.1982, fl. e fr., N.I. Matzenbacher 823 (holotype ICN).

Additional specimens examined: BRAZIL. RIO GRANDE DO SUL: Ozono, XII.1953, fl., J. Vidal IV-616 (R); Panambi, Granja L.I. Doth, I.IV.1972, fl., B. Irgang 9805 (CTES); Torres, BR-101, Campo Bonito, 10.II.1983, fl. e fr., A. Krapovickas & C.L. Cristóbal 38510 (C. CTES, G); 4 km S del acceso a Torres, BR-101, 31.I.1994, fl., A. Krapovickas & C.L. Cristóbal 44722 (CTES, G); Estrada do Mar, em frente à Barraca do Gaúcho, 22.I.2005, fl., V.C. Souza & V.F. Kinupp 30570 (ESA).

Among the species of the genus, it seems to be closely related to *L. glabrata* (Less.) H. Rob., from which it can be distinguished by the capitulum size and the phyllary shape. *Lessingianthus constrictus* possesses larger capitula and the phyllaries are notably caudate at the apex.

*Lessingianthus correntinus* (Cabrera & Cristóbal) Dematt., *comb. nov.* *Vernonia correntina* Cabrera & Cristóbal, *Hickenia* 1(24): 129. 1978. Type: ARGENTINA. CORRIENTES: Dept. Curuzú Cuatiá, Ruta 14, 8 km N de Curuzú Cuatiá, 8.I.1977, fl. e fr., A. Schinini & O. Ahumada 13895 (holotype CTES; isotypes CTES, LP, US).

This species is only known from the type locality in the southeast of Corrientes, Argentina. It appears to be related to *Lessingianthus macrocephalus* (Less.) H. Rob., from southern Brazil and Uruguay, that possesses seriate-cymose inflorescences (vs. corymbose) and scariosa (vs. leafy) phyllaries.





**Figure 2** – a-k. *Lessingianthus lapinhensis* Dematt. – a. plant; b. detail of the leaves; c. capitulum; d-e. outer phyllaries; f-g. middle phyllaries; h-i. inner phyllaries; j. corolla showing anthers and style; k. apex of the corolla lobe. (a-k Pirani 12129).

*Lessingianthus hystricosus* (Cabrera & Dematt.) Dematt., *comb. nov. Vernonia hystricosa* Cabrera & Dematt., *Candollea* 54: 103. 1999. Type: PARAGUAY. CORDILLERA: Tobaty, orillas del camino, 22.III.1975, fl. e fr., A. Schinini 10908 (holotype CTES; isotypes F, G, SI).

**Additional specimens examined:** PARAGUAY. AMAMBAY: 34 km al sur de Bella Vista, 13.III.1996, fl., A. Schinini, S. Ferrucci & A.M. Gonzalez 30446 (CTES, SI). CENTRAL: Asunción, II.1920, fl., C. Spegazzini 10805 (LP); 13.III.1937, fl. e fr., J. West 8511 (SI). PRESIDENTE HAYES: Estancia Salazar, 12.II.1993, fl. e fr., L. Pérez 2886 (CTES, SI). SAN PEDRO: Colonia Primavera, 12.II.1956, fl. e fr., A. Woolston 133a (LP, SI).

This species resembles some specimens of *Lessingianthus glabratus*, that occasionally have oblanceolate leaves. However, the latter species has 35-40 florets per capitulum and mostly glabrous leaves, while *L. hystricosus* has 20-30 florets per capitulum, the leaf blades hirsute above and densely pubescent below. It is widely distributed in eastern Paraguay, growing on the *cerrado* and *campo* habitats.

*Lessingianthus intermedius* (DC.) Dematt., *comb. nov. Vernonia intermedia* DC., *Prodr.* 5: 27. 1836. *Cacalia intermedia* Kuntze, *Revis. gen. pl.* 2: 970. 1891. Type: BRAZIL. Rio Grande, F. Sellow s.n. (holotype P; isotype G-DC).

**Additional specimens examined:** BRAZIL. RIO GRANDE DO SUL: ad fl. Caí, pr. Porto Alegre, 27.IV.1949, fl. e fr., B. Rambo 41258 (PACA); Grande, 1833, fl. e fr., C. Gaudichaud s.n. (P); Porto Alegre, Montserrat, 1944, fl., B. Rambo 28930 (PACA); Uruguaiana, estrada Plano Alto-João Arregue, apos o rio Epané, 3.XII.1994, fl., J.R. Stehmann 1576 (UEC).

It is one member of the *Lessingianthus plantaginoides* (Less.) H. Rob. complex that can be distinguished by the corymbose inflorescence and largely pedunculate capitula. Its most closely related taxon is *L. plantaginoides*, which possesses seriate-cymose inflorescences and sessile capitula.

*Lessingianthus kuntzei* (Hieron.) Dematt., *comb. nov. Vernonia kuntzei* Hieron., *Bot. Jahrb. Syst.* 22(4-5): 678. 1897. *Cacalia kuntzei* Kuntze, *Revis. gen. pl.* 3: 138. 1898. *Vernonia asteriflora* Mart. ex DC. subsp. *kuntzei* (Hieron.) S. B. Jones, *Brittonia* 34(1): 110. 1982. Type: BOLIVIA. Sierra de Santa Cruz, 3000 m alt., V. 1892, fl., O. Kuntze s.n. (Lectotype, designated by Jones (1982) B†, photo CTES; New Lectotype, designated here NY 00274868).

**Additional specimens examined:** BOLIVIA. CHUQUISACA: Prov. B. Boeto, Comunidad Ovejeros, 4 km al NE de la localidad de V. Serrano, 22.I.1994, fl., J.

Terán, J. Aníbarro & M. Serrano 550 (CTES, LPB). SANTA CRUZ: Auf Bergtriften der Cuesta de los Monos, III.1911, fl., Th. Herzog 1698 (L, LP); Prov. Cordillera, 3 km NE of Abra de Quiñe, 31.XII.1995, fl., M. Nee 46655 (USZ); Prov. Vallegrande, Comunidad de Chapas, 18°32,5'S 63°57,5'W, 26.XII.1993, fl., I.G. Vargas 3070 (CTES, USZ); Sabucal, 13,6 km de El Trigal, 4.II.1994, fl., C. Saravia Toledo 12309 (CTES).

Jones (1982) considered this species a subspecies of *Vernonia asteriflora*. However, both taxa have strong morphological differences and different geographic distribution. *Lessingianthus kuntzei* is distributed in southern Bolivia, between 1400 and 3500 m, while *L. asteriflorus* grows in eastern Paraguay and southern Brazil. The first taxon has lanceolate leaves, glabrous above and acute at the apex, while *L. asteriflorus* possesses oblanceolate to obovate leaves, lanate above and apically obtuse.

*Lessingianthus lanatus* (Cabrera) Dematt., *comb. nov. Vernonia glabrata* Less. var. *lanata* Chodat, *Bull. Herb. Boissier sér.* 2, 2(3): 304. 1902. *Vernonia lanata* (Chodat) Cabrera, *Hickenia* 2(35): 155. 1995. Type: PARAGUAY. GUAIRÁ: Cerro Pelado près de Villa Rica, IV.1876, fl. e fr., B. Balansa 774 (holotype G).

**Additional specimens examined:** BRAZIL. PARANÁ: Piraf do Sul, Joaquim Murinho, 21.III.1968, fl. e fr., G. Haenschbach 18797 (MBM). PARAGUAY. CAAGUAZÚ: 5 km S de Ithú, 10.III.2002, fl. e fr., A. Schinini, M. Dematteis, R. Duré & M. Quintana 36144 (CTES, PY). CORDILLERA: Itacurubí, III.1969, fl., A. Schinini 2632 (G, CTES). GUAIRÁ: Estancia J.C., Independencia, 13.II.1987, fl., G. Schmeda 840 (CTES). ITAPÚA: Encarnación, III.1944, fl., L. Jiménez 11091 (LP). PARAGUARÍ: In valle fluminis Y-acá, in campis montanis, XII.1900, fl. e fr., E. Hassler 6867 (BM, G, K).

This species resembles *Lessingianthus niederleinii* (Hieron.) H. Rob. with similar capitulum shape and inflorescence pattern, but it differs in the shape, distribution and size of the leaves, in addition to the plant being taller than the other species.

*Lessingianthus laniferus* (Cristobal & Dematt.) M. B. Angulo, *comb. nov. Vernonia lanifera* Cristóbal & Dematt., *Darwiniana* 40(1-4): 51. 2002. Type: ARGENTINA. MISIONES: Dept. San Javier, Ayo. Portera, 10 km E de San Javier, 21.I.1976, fl. e fr., A. Krapovickas & C.L. Cristóbal 28821 (holotype CTES; isotypes C, G, MICH, MO, SI, UC).

**Additional specimens examined:** ARGENTINA. MISIONES: Dept. Gral. Manuel Belgrano, Campinas de America, 27.VIII.2006, fl., H. Keller 3663 (CTES); Dept. Candelaria, Loreto, 25.I.1945, fl. e fr., J. E. Montes



523 (SI); Dept. San Ignacio, San Ignacio, 29.XII.1946, fl., J.E. Mouton 2378 (SI). CORRIENTES: Dept. Ituzaingó, 15 km E de ruta nacional 12, 11.II.1971, fl., A. Krapovickas et al. 18056b (BA, BAA, CTES, LP, TEX). BRAZIL. PARANÁ: Ponta Grossa, 10.I.1915, fl., P. Dusén 16299 (S); Pirafó do Sul, Serra de Furnas, 22.XII.2000, fl. e fr., J. Carneiro 853 (CESJ, MBM). RIO GRANDE DO SUL: Palmeira, 30.I.1952, fl., B. Rambo 51958 (S); 25 km S de Vacaria, BR-116, 29.I.1973, fl., A. Krapovickas, C.L. Cristóbal & V. Maruiak 23016 (CTES). SANTA CATARINA: Campo Eré, Fazenda Campo São Vicente, 29.II.1964, fl., R. M. Klein 5027 (HBR, LP); Campos Novos, 3 km West of Campos Novos, 9.II.1957, fl. e fr., L.B. Smith & R.M. Klein 11151 (HBR).

*Lessingianthus laniferus* belongs to the *L. rubricaulis* (Humb. & Bonpl.) H. Rob. complex, which possesses shortly seriate-cymose inflorescences, sessile capitula, 30–40 florets per capitulum and linear to linear-lanceolate leaves, incanus to lanate beneath. However, *L. laniferus* can be distinguished from the remaining taxa of the group by its lanate pubescence on the abaxial surface of the leaves (Dematteis 2004).

*Lessingianthus profusus* (Dematt. & Cabrera) M.B. Angulo, *comb. nov.* *Vernonia profusa* Dematt. & Cabrera, *Candollea* 54: 105. 1999. Type: PARAGUAY. AMAMBAY: alrededores de P.J. Caballero, 13.III.1996, fl. e fr., A. Schinini, S. Ferrucci & A.M. González 30440 (holotype CTES; isotypes G, LP, TEX).

**Additional specimens examined:** BRAZIL. MATO GROSSO: Chapada dos Guimarães, road from Buriti to Água Fria, 17.III.1996, fl. e fr., B. Dubs 2097 (S). MATO GROSSO DO SUL: Ponte do Grego, rio Aquidauana, 31.I.1979, fl. e fr., A. Krapovickas & C.L. Cristóbal 34490 (CTES); Amambai, arredores da tribo Caiuá, 1979, fl. e fr., W.G. Garcia 13949 (UEC); rio Amambay, camino Ponta Porá-Amambay, 23.II.1968, fl. e fr., A. Krapovickas et al. 14143 (CTES). PARAGUAY. AMAMBAY: Parque Nacional Cerro Corá, III.1993, fl. e fr., N. Soria 6167 (FCQ). CORDILLERA: Cerro Tobatí, 28.I.1988, fl., E. Zardini & R. Degeu 4285 (FCQ).

This taxon belongs to the *Lessingianthus niederleinii* complex, but it can be distinguished by its ample inflorescence with its capitula positioned between the leafy bracts (not axillary).

*Lessingianthus pusillus* (Dematt.) M. B. Angulo, *comb. nov.* *Vernonia pusilla* Dematt., *Bonplandia* (Corrientes) 13(1–4): 10. 2004. Type: PARAGUAY. PARAGUARI: frente a Florida, orilla río Tebicuary, 4.II.1966, fl. e fr., A. Krapovickas, C.L. Cristóbal & R. Palacios 12396 (holotype CTES; isotype LP). **Additional specimens examined:** ARGENTINA. CIIACO: Dept. 1° de Mayo, Colonia Benítez, III.1932,

fl., A.G. Schulz 203 (CTES). CORRIENTES: Dept. Capital, Perichón, 18.XII.1975, fl. e fr., A. Schinini & R. Martínez Crovetto 12247 (CTES). FORMOSA: Dept. Pilcomayo, Puente Sastre, 17.III.1948, fl., I. Morel 5107 (CTES). SANTIAGO DEL ESTERO: Dept. Gral. Taboada, camino entre Bandera y Cuatro Bocas, 25.II.1973, fl. e fr., M. Elisetch 328 (CTES). PARAGUAY. AMAMBAY: Bella Vista, Estancia Apa-mí, 28.XII.1996, fl. e fr., J. Molero & R. Duré 1116 (BCN). BOQUERÓN: Colonia Fernhein, Estancia Laguna Porá, 1.III.1991, fl., R. Vanni 2628 (CTES). CAAGUAZÚ: Arroyo Yukareí, 8.II.1989, fl. e fr., E. Zardini & Velázquez 10803 (FCQ). CENTRAL: Santa Trinidad, Asunción, 29.I.1946, fl. e fr., G. W. Teague 661 (BM). PARAGUARÍ: In regione collium Cerros de Paraguari, marginis silvis prope Paraguari, XII.1900, fl. e fr., E. Hassler 6571 (BM, G, K, P, S, W).

*Lessingianthus rigescens* (Malme) Dematt., *comb. nov.* *Vernonia rigescens* Malme, *Kongl. Svenska Vetensk.-Akad. Handl.* 32(5): 27. 1899. Type: BRAZIL. MATO GROSSO: Santa Anna da Chapada, in cerrado minus denso, 7.III.1894, fl., G. O. Malme 1462 (holotype S).

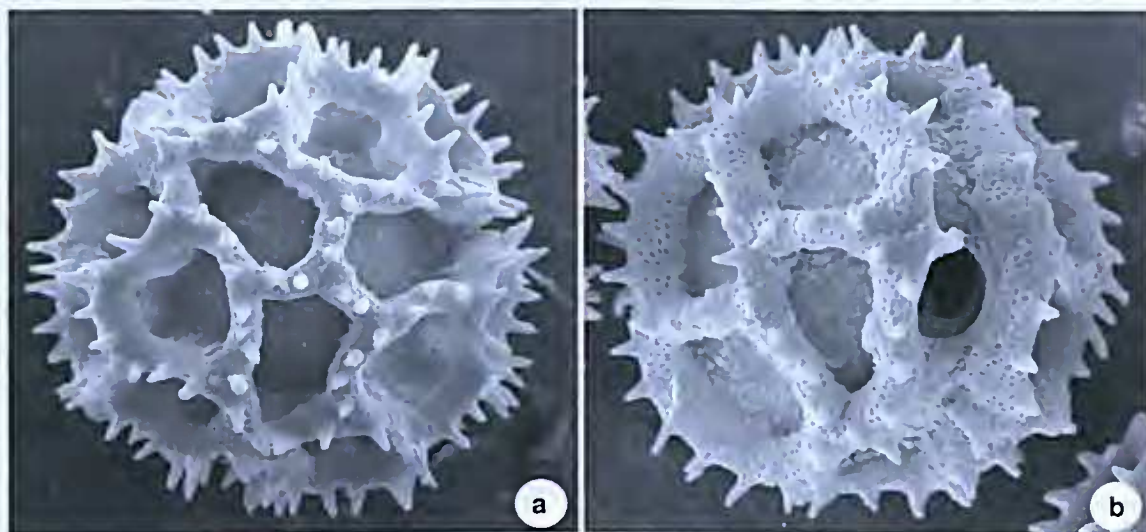
**Additional specimens examined:** BRAZIL. MATO GROSSO: Cuiabá, 1834, fl., P. Silva Manso 8 (BR); Santa Anna da Chapada, 16.V.1903, fl. e fr., G. O. Malme s.n. (S); 17.V.1903, fl., G. O. Malme s.n. (S); 8 km NE of the base campo of the expedition, 12°54'S, 51°52'W, 9.IV.1968, fl. e fr., J. A. Ratter 916 (K).

*Lessingianthus rigescens* seems to be related to *L. laevigatus* (Mart. ex DC.) H. Rob., from which it differs by the pilose corolla lobes and narrowly linear leaf blades, apically acute. The latter has glabrous corolla lobes and linear-lanceolate leaves, rounded to sub-obtuse at the apex.

*Lessingianthus sancti-pauli* (Hieron.) Dematt., *comb. nov.* *Vernonia sancti-pauli* Hieron., *Bot. Jahrb. Syst.* 22(4–5): 687. 1897. Type: BRAZIL. SÃO PAULO: s.l., L. Riedel 589 (holotype B† - photo CTES; lectotype, designated here G; isolectotypes K, L).

**Additional specimens examined:** BRAZIL. MINAS GERAIS: in campis ad Curvelho, III.1835, fl., P. W. Lund s.n. (C); Lagoa Santa, fl. e fr., E. Waruing 2669 (C, P). PARANÁ: Balsa Nova, Felipe de Cancela, 20.I.1992, fl. e fr., I. M. Langohr 31 (MBM); Palmeira, BR-277, descida rio Capivara, 8.III.1984, fl. e fr., G. Hatschbach 47835 (CTES); II.1985, fl. e fr., L.T. Doubrowski 12955 (MBM); Vila Velha, 29.IV.1914, fl. e fr., P. Dusén 14822 (G). SANTA CATARINA: Lajes, campo 16 km east of Lajes on the road to Painel, 15.I.1957, fl., L.B. Smith & R.M. Klein 10100 (LP). SÃO PAULO: about 1 km NW from the Tanque de Zunica, 3.II.1827, fl. e fr., W.J. Burchell 4111 (P, W); Itararé, fazenda Ibiti, 9.IV.1989, fl. e fr., C.A.M. Scaramuzza & V.C. Souza 198 (ESA);





**Figure 3** – Pollen grains of *Lessingianthus*. a. *L. foliosus* – polar view. b. *L. lapinhensis* – equatorial view, colporous (a Glazion et al. 8133; b Pirani et al. 12129)

Jabaquara, Capital, 9.III.1939, fl. e fr., *G. Hashimoto* 406 (SP); São José dos Campos, XII.1908, fl., *A. Lofgren* 111 (RB); 8 km SW de São José dos Campos, 30.I.1962, fl. e fr., *I. Mimura* 230 (SP).

This taxon possesses the northernmost distribution of a species belonging to the *Lessingianthus plantaginoides* complex. Its area includes the Brazilian states of Minas Gerais, Paraná, Santa Catarina and São Paulo. The species of this complex have lanate stems, campanulate involucre, linear lanate phyllaries and narrowly linear leaves, densely woolly beneath. It can be easily distinguished by the seriate-cymose inflorescences having short branches, with the lower capitula pedunculate and the upper ones sessile. *Lessingianthus plantaginoides* shows large branches in the inflorescence and the capitula are all sessile.

*Lessingianthus spicatus* (Cabrera) Dematt., *comb. nov.* *Vernonia spicata* Cabrera, Darwiniana 18(3-4): 414. 1974. Type: ARGENTINA. MISIONES: Dept. San Ignacio. Puerto España, 12.I.1918, fl. e fr., *G.J. Schwarz* 5391 (holotype LIL).

**Additional specimens examined:** ARGENTINA. MISIONES: Dept. San Ignacio, Santo Pipó, 19.II.1948, fl., *A.G. Schulz* 7185 (CTES); La Plantadora, 2.II.1948, fl. e fr., *G.J. Schwarz* 5491 (LIL, CTES).

It appears to be closely related to *Lessingianthus polyphyllus* (Sch. Bip.) H. Rob., but can be easily separated by the inflorescence pattern. *L. spicatus* has pseudo-spicate inflorescences, while *L. polyphyllus*

possesses seriate-cymose branches. This is only known from the rocky soils of southern Misiones, Argentina.

*Lessingianthus teyucuaensis* (Cabrera) Dematt., *comb. nov.* *Vernonia teyucuaensis* Cabrera, Darwiniana 28(1-4): 187. 1987. Type: ARGENTINA. MISIONES: Dept. San Ignacio, Teyucuaré, 14.II.1980, fl. e fr., *A. Schinini* 19870 (holotype SI; isotype CTES).

**Additional specimens examined:** ARGENTINA. MISIONES: Dept. San Ignacio, Casa de Horacio Quiroga, 25.III.1996, fl. e fr., *M. Dematteis* 515 (CTES); Teyú Cuaré, 6.II.1982, fl. E fr., *A. Schinini et al.* 21889 (paratypes CTES, SI); 9.II.1995, fl. e fr., *M. Dematteis* 476 (CTES); camino a Teyú Cuaré, 20.II.1994, fl. e fr., *M. Dematteis et al.* 298 (CTES, MNES).

This species is closely related to *Lessingianthus glabratus*, but can be separated by the shape of leaves and the outer phyllaries. *Lessingianthus teyucuaensis* possesses widely obovate leaf blades and ovate phyllaries, while *L. glabratus* has narrowly lanceolate leaves and lanceolate to ovate-lanceolate phyllaries. *Lessingianthus constrictus* differs in having constricted phyllaries and lanceolate leaves.

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